Claims:

1. An optical fibre emulator, comprising:

an optical signal demodulator, having an input port for receiving a digitally-encoded optical signal and an output port for producing a digitally-encoded electrical signal corresponding to said digitally-encoded optical signal;

a digital shift register for propagating digital data encoded on said electrical signal, said shift register having an input port for receiving said digital data encoded on said electrical signal, an information transfer rate substantially equal to the information transmission rate of a section of optical fibre of given length for a given wavelength, and an output port for reproducing said digital data after a predetermined time delay; and

an optical signal modulator, having an input port for receiving said digital data from said output port of said shift register and an output port for producing a digitally-encoded optical signal corresponding to said digitally-encoded electrical signal, the information transfer time from said input port of said optical signal demodulator to said output port of said optical signal modulator being less than or equal to the information transfer time of said section of optical fibre.

2. The optical fibre emulator of claim 1, further comprising an optical signal attenuator, having an input port for receiving said digitally-encoded optical signal from said optical signal modulator and an output port for producing an attenuated version of said digitally-encoded optical signal.

3. The optical fibre emulator of claim 2, wherein the amount of attenuation introduced by said optical signal attenuator is substantially equal to the amount of attenuation experienced by an optical signal propagating through said section of optical fibre, and the information transfer time from said input port of said optical signal demodulator to said output port of said optical signal attenuator is substantially equal to the information transfer time of said section of optical fibre.

4. The optical fibre emulator of claim 1, wherein said shift register comprises a series of digital registers wherein data is shifted periodically from one to the next, and said output port may be selectively connected to any of said shift registers to vary the amount of time delay introduced by said shift register.

5. The optical fibre emulator of claim 1, further comprising a serial-to-parallel bit converter disposed between said optical signal demodulator and said input port of said digital shift register so as to convert serial-bit digital data words received from said demodulator to parallel-bit data words for application to said shift register, and a parallel-to-serial bit converter disposed between said output port of said digital shift register and said optical modulator so as to convert parallel-bit data words derived from said shift register to serial-bit words for modulation of said optical carrier signal.

6. The optical fibre emulator of claim 5, further comprising a digital decoder disposed between said serial-to-parallel bit converter and said input port of said digital shift register so as to convert a transmission code of a first length to a data code of a second, shorter length prior to application of said digital data to said shift register, and a digital encoder disposed between said output port of said shift register and said parallel-to-serial bit converter so as to convert said data code of said second length to said transmission code of said first length prior to application of said digital data to said parallel-to-serial bit converter.

7. The optical fibre emulator of claim 6, wherein the length of said transmission code is 10 bits and the length of said data code is 8 bits.

8. The optical fibre emulator of claim 6, further comprising an optical signal attenuator, having an input port for receiving said digitally-encoded optical signal from said optical signal modulator and an output port for producing an attenuated version of said digitally-encoded optical signal.

9. The optical fibre emulator of claim 8, wherein the amount of attenuation introduced by said optical signal attenuator is substantially equal to the amount of attenuation experienced by an optical signal propagating through said section of optical fibre, and the the information transfer time from said input port of said optical signal demodulator to said output port of said optical signal attenuator is substantially equal to the information transfer time of said section of optical fibre.

10. The optical fibre emulator of claim 1, further comprising a digital decoder disposed between said serial-to-parallel bit converter and said input port of said digital shift register so as to convert a transmission code of a first length to a data code of a second, shorter length prior to application of said digital data to said shift register, and a digital encoder disposed between said output port of said shift register and said optical signal modulator so as to convert said data code of said second length to said transmission code of said first length prior to application of said digital data to said optical signal modulator.

11. The optical fibre emulator of claim 10, wherein the length of said transmission code is 10 bits per word and the length of said data code is 8 bits per word.

12. A method for emulating an optical fibre, comprising:

receiving an input digitally-encoded optical signal and producing a digitally-encoded electrical signal corresponding to said input digitally-encoded optical signal;

delaying said digital data for a predetermined time; and

receiving said digital after said predetermined time and producing a delayed digitally-encoded optical signal corresponding to said digitally-encoded electrical signal, the information transfer time from receipt of said input digitally-encoded optical signal to production of said delayed digitally-encoded optical signal being less than or equal to the information transfer time of a section of optical fibre to be emulated.

13. The method of claim 12, further comprising attenuating said delayed digitally-encoded optical signal so as to produce an output digitally-encoded optical signal, the information transfer time from receipt of said input digitally-encoded optical signal to production of said output digitally-encoded optical signal being substantially equal to the information transfer time of said section of optical fibre.

14. The method of claim 12, further comprising selecting said predetermined time delay so as to correspond to said section of optical fibre.

15. The method of claim 12, wherein said step of receiving and reproducing said digitally-encoded electrical signal includes converting said electrical signal from serial-bit form to parallel-bit form, propagating said electrical signal through a transmission line of predetermined length at a rate substantially equal to the information transfer rate of said section of optical fibre, and then converting said electrical signal from parallel-bit form to serial-bit form.

16. The method of claim 15, wherein said step of receiving and reproducing said digitally-encoded electrical signal further includes converting said electrical signal in parallel form from a transmission code of a first length to a data code of a second, shorter length prior to propagation, and, after propagation, converting said data code of said second length to said transmission code of said first length prior to converting said electrical signal from parallel-bit form to serial-bit form.

17. The method of claim 16, wherein said transmission code is 10 bits per word and the length of said data code is 8 bits per word.

18. The method of claim 12, wherein said step of receiving and reproducing said digitally-encoded electrical signal further includes converting said digitally-encoded electrical signal from a transmission code of a first length to a data code of a second, shorter length prior to propagation, and, after propagation, converting said data code of said second length to said transmission code of said first length prior to producing a delayed digitally-encoded optical signal corresponding to said digitally-encoded electrical signal.

19. The method of claim 18, further comprising attenuating said delayed digitally-encoded optical signal so as to produce an output digitally-encoded optical signal, the information transfer time from receipt of said input digitally-encoded optical signal to production of said output digitally-encoded optical signal being substantially equal to the information transfer time of said section of optical fibre.